

Rising Toxic Tide

Pesticide Use in California, 1991-1995

by James Liebman, Ph.D., Staff Scientist

**with Research Assistance from
Colin Brewer, Martin Bourque, Anne Katten,
Corrina Marie Rice and Kelly Campbell**



One in a series of reports by Californians for Pesticide Reform

D - 0 4 2 9 7 2

D-042972

Executive Summary

Each year California is drenched with literally hundreds of millions of pounds of chemicals applied to our crops, to our soil and water, and to our homes, schools and workplaces. Many of these materials are toxic, and their use is increasing each year.

Many Californians believe that environmental protection and sustainable agriculture are alive and well in the Golden State. However, the state's own data indicate that California is moving in the wrong direction, toward increasing use of and dependence on toxic materials. Rather than learning to live in harmony with nature, the data instead show that Californians are engaged in routine, massive and increasing use of toxic chemicals over vast areas of the state.

California uses 25% of all U.S. pesticides

One-fourth of all pesticides used in the United States are applied in California. Looked at another way, more than 6.5 pounds of pesticidal active ingredients are used per person each year in California, more than double the national rate of 3.1 pounds per capita.

Pesticide use in California is increasing

Reported pesticide use in California increased 31% between 1991 and 1995, from 161 to 212 million pounds of active ingredient (Figure A). Approximately 90% of all reported pesticide use occurs in production agriculture, and agricultural pesticide use increased 37% between 1991 and 1995.

The increases in use were not due to increases in planted acreage. Statewide, acreage has remained constant during this time period. Instead, the intensity of pesticide use increased 35%, from an average of 18 to nearly 25 pounds per harvested acre (Figure B).

Use of the most toxic pesticides is increasing

- Use of the most toxic pesticides rose dramatically between 1991 and 1995 (Figure C). Use of cancer-causing pesticides rose 129%, to more than 23 million pounds, and now accounts for 11% of total pesticide use in the state.
- Use of acutely toxic nerve poisons rose 52%, to almost nine million pounds.

Figure A: Pesticide use in California increased 31% between 1991 & 1995

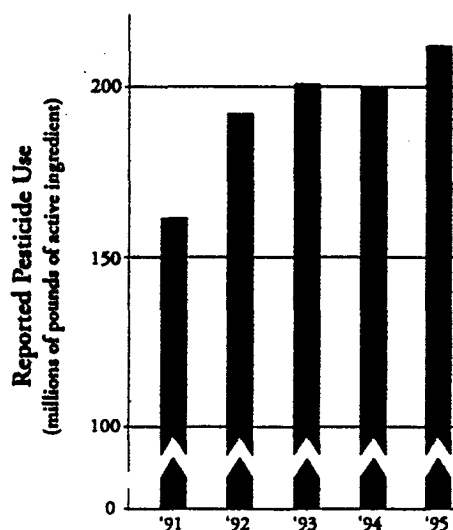
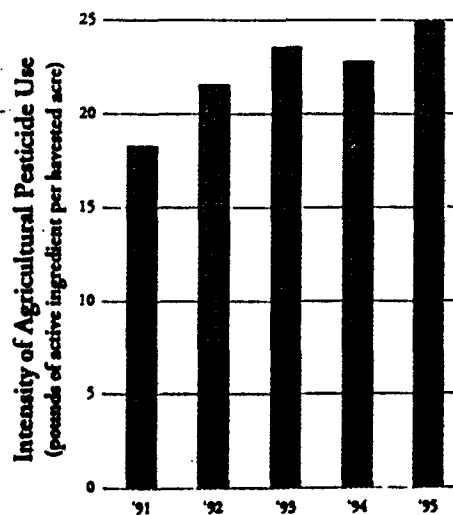


Figure B: Intensity of agricultural pesticide use increased 35% between 1991 & 1995



- Use of Restricted Use Pesticides—those shown in practical experience in the real world to cause injury to people, crops and the environment—increased 34%, to 48 million pounds in 1995.
- The total volume of carcinogens, reproductive hazards, endocrine disruptors, Category I highly acute systemic poisons, Category II nerve toxins and Restricted Use Pesticides increased 32% between 1991 and 1995, and now comprise 72 million pounds, or 34% of total reported pesticide use in the state.

Strawberries and grapes receive the most pesticides

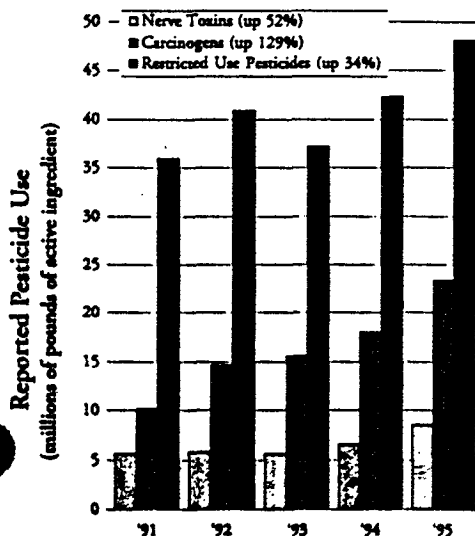
Pesticides are applied much more heavily on some crops than others.

- California strawberries are grown on only about 23,000 acres, yet farmers use over seven million pounds of pesticides on the crop each year. Strawberries are the most intensively treated crop in the state, receiving an average of over 300 pounds of pesticide active ingredient per acre per year.
- Of all crops in the state, the highest volume of pesticides was applied to grapes: 59 million pounds in 1995. Most (49 million pounds) of this material was sulfur; although sulfur is not a systemic poison, it is acutely irritating to the skin and eyes and is responsible for the highest number of reported worker injuries in California.

Pesticide use is heavy in many areas of the state

Eight adjacent counties in the San Joaquin Valley, where intensive farming is a primary land use, account for 60% of reported pesticide use in the state. Heavy pesticide use also occurs in California's other major agricultural areas: the Central Coast (Monterey, Santa Barbara and Ventura Counties), the Southern Deserts (Riverside and Imperial Counties), the North Coast wine country (Napa and Sonoma Counties), and the Sacramento Valley (Sacramento, Butte, Sutter, Yolo and Colusa Counties). In addition, there is a large but unreported use of pesticides in homes and gardens.

Figure C: Use of the most toxic pesticides increased dramatically between 1991 & 1995



The public supports reduced use of pesticides

There is strong public support for reducing pesticide use. Numerous independent surveys reveal strong consumer concern about pesticide residues on food. In addition to polling results, consumers are "voting with their pocketbooks" on these issues. Sixty percent of Californians purchase organic food at least "sometimes" and the organic foods industry is growing at 20% annually.

State government is not addressing the problem

Reducing pesticide use requires regulation of pesticides, research into and implementation of alternatives, and an informed public with access to information

about pesticide use. Unfortunately, the Department of Pesticide Regulation, the primary state agency responsible for regulating pesticides in California, has proposed cutting its budget and scaling back the pesticide use reporting system. California's research and extension programs are not effective at reducing pesticide use.

Policy Recommendations: Less pesticide use and more public access to information

It is poor public policy to routinely apply tens of millions of pounds of highly toxic materials to our food, fiber, soil, air and water. It is far safer and cheaper to prevent dispersion of toxic materials into the environment. Unfortunately, California's regulatory agencies are not fulfilling their public mission if they function to merely legalize and set as standard-operating-procedure the increasing use of toxic pesticides.

It is crucial that California chart a new course—toward sustainable agriculture and toward improved human and environmental health—by committing to a reduction in the use of and reliance on pesticides. To accomplish this goal, we recommend the following:

- **Improve the public's right to know about pesticide use**

There must be a substantial effort to honor the public's right-to-know about release of toxic materials into the environment and to make these data widely available and accessible. California's Pesticide Use Reporting System must be made more accurate and more easily accessible to the public.

- **Launch a statewide effort to reduce pesticide use**

California's agricultural research and extension services should make a serious commitment to reducing pesticide use and promoting sustainable agriculture. We recommend that federal and state pest management programs include as a primary goal reducing the use of and dependence on pesticides. Programs should be evaluated for their ability to effect reductions in pesticide use in the real world, not just on research plots, and these reductions should be tracked and quantified using the state's pesticide use reporting system. Particular emphasis should be placed on reversing the current trend of increases in the use of the most toxic pesticides.

- **Keep the Mill Tax high enough to fund pesticide regulation**

DPR's budget should not be cut at a time when pesticide use is skyrocketing. Rather, the agency should be spending its funds on efforts to increase public access to information about pesticide use, and to significantly reduce pesticide use. As a wholesale tax on pesticide users, the Mill Tax fairly transfers money from those engaged in releasing pesticides into the environment to the agency charged with regulating that use. We recommend that, at a minimum, the Mill Tax be set at 22 mills (2.2¢ on each dollar of pesticide sales), the rate prevailing during the mid-1990s.

¹ DPR, 1995, op. cit.

² Pease et al., 1993, op. cit.

year. Increases thus far were especially large for the herbicides acrolein, 2,4-D, molinate, paraquat and thiobencarb; the insecticides aldicarb, carbaryl, methamidophos and methomyl; and the fumigants 1,3-dichloropropene and metam-sodium.

Use of the most toxic pesticides of each type also increased. Use of the most toxic herbicides increased 21%, insecticides 23%, fun-

gicides 44%, fumigants 25%, and vertebrate (bird and rodent) poisons 7% (Appendix 4).

The total volume of carcinogens, reproductive hazards, endocrine disruptors, Category I highly acute systemic poisons, Category II nerve toxins, and restricted use pesticides increased 32% between 1991 and 1995, and now comprise 72 million pounds, or 34% of total reported pesticide use in the state.

continued on page 9

Table 3: Summary of the Reported Use of Toxic Pesticides in California, 1991 - 1995.

Pesticide Category	Use as a Percentage of Total Pesticide Use in 1995	Change between 1991 and 1995
Carcinogens	11%	Increased 129%, from 10.2 to 23.4 million pounds
Reproductive Toxins ¹	9%	Steady at approximately 18 million pounds per year.
Endocrine Disruptors	5%	Steady at approximately 10 million pounds per year.
U.S. EPA Category I, acute systemic toxins, labeled by law with a skull & crossbones and the words "DANGER/POISON"	13%	Steady at approximately 30 million pounds per year.
U.S. EPA Category II nerve toxins	4%	Increased 52%, from 5.6 to 8.6 million pounds
Restricted Use Pesticides	23%	Increased 34%, from 36.0 to 48.2 million pounds
Total of all carcinogens, reproductive toxins, endocrine disruptors, Category I, Category II nerve toxins, and Restricted Use Pesticides ²	34%	Increased 32%, from 54.65 to 71.9 million pounds
Total Reported Pesticide Use	100%	Increased 31%, from 161.1 to 211.8 million pounds

Reported use of pesticides increased 31% from 1991 to 1995. Particular categories of officially designated toxins also increased. Use of cancer-causing pesticides increased 129%, use of U.S. EPA Category II nerve toxins increased 52%, and use of Restricted Use Pesticides increased 34%. Together, these most toxic pesticides comprise 34% of the weight of total reported pesticide use in the state.

¹ Methyl bromide is listed as a Developmental Toxin (OEHHA 1996) for structural uses but not for agricultural field use. This is scientifically indefensible inasmuch as the identical chemical is used for both situations. Therefore, we have included all uses of methyl bromide in our calculations for reproductive toxins.

² Many pesticides appear on more than one hazard and toxicity list; the total reported here counts each material only once, hence the sum of the percentages for the pesticide categories is greater than the total percentage given for all the materials taken together.

Appendix 3: Intensity of Pesticide Use by County, continued

County	Intensity of Pesticide Use on Agricultural Land (lbs active ingredient applied per harvested acre)	Pesticides Applied to Production Agriculture Land (thousands of lbs active ingredient)	Harvested Acreage (thousands of acres)
San Diego	14.59	1,040	71.3
San Francisco	not available	13	not available
San Joaquin	24.85	11,646	468.6
San Luis Obispo	1.57	161	102.8
San Mateo	31.41	201	6.4
Santa Barbara	37.17	3,386	91.1
Santa Clara	9.88	244	24.7
Santa Cruz	75.07	1,689	22.5
Shasta	12.09	289	23.9
Sierra	0.34	1	2.9
Siskiyou	5.36	426	79.5
Solano	13.39	1,672	124.9
Sonoma	48.70	3,925	80.6
Stanislaus	18.27	5,504	301.3
Sutter	15.07	3,497	232.0
Tehama	14.82	895	60.4
Trinity	1.67	1	0.6
Tulare	29.51	17,927	607.4
Tuolumne	6.00	6	1.0
Ventura	51.80	5,553	107.2
Yolo	10.91	3,120	286.1
Yuba	24.79	1,735	70.0
State Totals	25.01	194,100 ¹	7,760.8

¹This value disagrees by some 1.6 million pounds from the value given in Table 2 (192.5 million pounds). The discrepancy is less than 1% and results from a lack of clarity in the method used by DPR to distinguish between agricultural and non-agricultural pesticide applications.

Sources:

Pesticides applied: DPR 1996b.

Harvested acreage: CASS 1993.

Intensity of Pesticide Use (column 2): by division of Pesticides Applied (column 3) by Harvested Acreage (column 4).

Appendix 2: Total Reported Pesticide Use by County and Region, 1991 - 1995 (thousands of pounds active ingredient)

Region & County	1991	1992	1993	1994	1995
Sacramento Valley	20,597	22,550	23,671	23,645	24,212
Butte	3,435	3,178	3,678	3,756	3,578
Colusa	1,965	2,210	2,823	2,613	2,957
Glenn	3,034	2,349	2,520	2,736	2,358
Sacramento	2,586	3,181	3,261	2,556	3,919
Solano	1,988	2,057	2,043	2,198	1,825
Sutter	2,626	3,704	3,554	3,237	3,556
Tchama	820	842	939	565	953
Yolo	2,698	3,603	3,374	4,839	3,294
Yuba	1,444	1,426	1,478	1,145	1,772
San Joaquin Valley	88,313	105,390	123,235	122,118	126,507
Fresno	23,274	31,753	40,368	37,651	40,569
Kern	17,593	19,125	20,838	22,146	25,898
Kings	4,278	3,927	5,572	5,366	6,724
Madera	7,846	9,585	11,124	10,886	9,647
Merced	6,809	8,157	8,367	8,667	7,898
San Joaquin	9,851	12,745	12,436	13,009	12,036
Stanislaus	6,253	5,783	7,463	7,354	5,796
Tulare	12,410	14,315	17,068	17,039	17,938
North Coast	6,905	7,986	10,684	9,891	10,132
Del Norte	190	201	229	156	225
Humboldt	41	53	50	69	76
Lake	916	1,280	1,501	388	1,001
Mendocino	1,305	1,747	1,699	1,780	1,916
Napa	2,134	2,346	3,819	2,888	2,887
Sonoma	2,318	2,359	3,386	4,609	4,027
Bay Area	5,011	10,201	1,591	1,541	1,573
Alameda	400	512	404	460	528
Contra Costa	944	693	686	675	677
Marin	61	77	89	68	55
San Francisco ¹	3,359	8,544	30	27	31
San Mateo	246	375	381	311	281
Central Coast	11,279	13,734	12,667	14,336	17,796
Monterey	6,959	8,534	8,209	9,195	12,863
San Benito	345	446	446	613	638
San Luis Obispo	1,637	1,899	1,728	1,829	1,732
Santa Clara	706	786	770	810	807
Santa Cruz	1,632	2,070	1,514	1,890	1,756